International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Amazing Plant Kali Haldi Curcuma Caesia Roxb

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Abstract

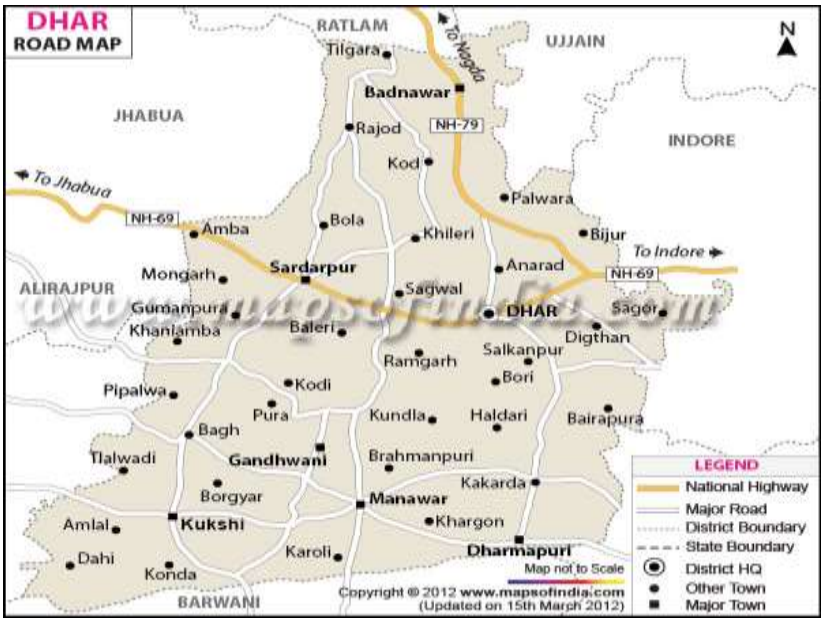
Curcuma caesia Roxb. holds immense medicinal significance. it is also endowed with anti-fungal, anti-plasmodial, anti-asthmatic, anti-inflammatory, anti-diabetic, anti-microbial, and anti-cancer attributes. Local communities utilize black turmeric to treat ailments such as leukoderma (white patches), tumors, hemorrhoids, bronchitis, pneumonia, asthma, and the common cold; furthermore, it is also employed in the treatment of scorpion stings and snakebites. Given its profound importance, this plant should be conserved within its natural habitat; concurrently keeping its significance in mind farmers should be sensitized to its value, and efforts should be made to promote its cultivation wherever feasible.

Keyword: Curcuma caesia Roxb. Anti-Asthmatic Activity, Depressant and hypnotic activity, antifungal activity, Anticancer

Introduction

Black turmeric is a highly significant medicinal plant. It is referred to as "black turmeric" because, when cut open, its interior reveals a blue or black coloration; this serves as its distinctive identifying feature. Furthermore, it can be recognized by the presence of black or purple stripes found on its leaves. It is primarily utilized for medicinal purposes; in Madhya Pradesh, various tribal communities use this plant to treat ailments such as asthma, coughs, colds, and fevers. The plant is also known for its pleasant fragrance,Black turmeric is used in Ayurvedic, Homeopathic, Unani and Siddha systems of medicine.

Study area



TAXONOMICAL HIERARCHY

Kingdom: Plantae
Subkingdom: Viridaeplantae
Phylum: Tracheophyta Sinnott
Subphylum: Euphyllophytina
Class: Magnoliopsida "monocotyledons" "commelinids"
Order: Zingiberales
Family: Zingiberaceae
Subfamily: Zingiberoideae
Tribe: Hedychieae
Genus: Curcuma
Species: C. caesia Roxb.

Methodology

It was studied periodically; further information was gathered from local residents, and various details were also obtained from the internet. I took numerous photographs using my mobile camera and searched for and read various research papers online. Numerous research papers published on Google Scholar, PubMed, ResearchGate, online libraries, and research journals were studied.

Curcuma caesia

Indian and foreign language name

Hindi Kali Haldi, Nar Kachura,Krishna kedar,Manipuri Yaingang Amuba or yaimu,Marathi Kala-haldi,Telugu Nalla Pasupu, Manupasupu,Kannada Kariarishina, Naru kachora,Bengali Kala haldi,Mizo Aihang, Ailaihang,Assamese Kala haladhi,Arabic Gadwâr aswad.,English Black zedoary,French Zédoaire noir,German Schwarze zedoarwurzel,Italian Zedoaria nera.,Malay Temu hitam,Neplaese Kaalo haledo,Turkish Kara cadvar.,

Curcuma caesia plant description

Root :

As the plant propagates with rhizome, the primary roots are not seen; however, yellow brown long fibrous and tapering adventitious roots are present all over the surface of rhizome.

Rhizome:

The rhizome is tuberous with camphoraceous sweet odour, about 2–6 cm in diameter, the shape and size is often variable. It is sessile, laterally flattened and covered with adventitious roots, root scars and warts. It shows longitudinal circular wrinkles on the surface giving the look of nodal and intermodal zones to the rhizomes. The surface (cork) of rhizome is dark brown, bluish black, or buff in colour.

Leaves: The leaves are usually present in the groups of 10–20; each leaf is broad oblong lanceolate and glabrous. A deep farraginous purple colour is present in the middle region of the lamina The petiole is ivory in colour and ensheathing the petiole encircle each other forming pseudoxis.

Inflorescence : It is 15-20 cm long dense spike, which arises much before the opening of leaf, the bracts are green, and the bracts of coma are deep red, which become crimson after maturation. Flower Flowers are pale yellow colour with reddish border . Calyx: 10-15 mm long, obtuse and 3 toothed. Collora: long tubular, pale yellow lip-3 lobe semi- elliptic. mature plant


Curcuma caesia Roxb.


Rhizome **root**


Rhizome

PHYTOCHEMICAL COMPOSITIONS

1. Curcuminoid: Although black turmeric is not as well known for its curcumin content as yellow turmeric, it does contain curcuminoid, which are known for their potential health benefits.
2. Essential oils: Rhizomes contain essential oils with complex aromas and are often used in perfumery and traditional medicines.
3. Starch: Rhizomes are rich in starch, making them an energy source.

Tribal practices

1. Ethnomedicinal plants from Gohpur of Sonitpur district Assam was done and population used for the study was mainly dominated with assamese, Bodo, Mishing, Nepali and Santhal communities of local healers. .
2. Rhizomes are often used for treatment of leucoderma, piles, bronchitis, asthma, Tumors, tuberculous glands of the neck, enlargement of the spleen, epileptic
3. Documentation of traditional herbal knowledge of Khamptis, a major tribe of the state of Arunachal Pradesh was done and found that they used crushed collar paste of Curcuma caesia plants to heal severe wounds and injuries .
4. An ethnobotanical survey among the Garo tribal healers to gather information of the plants, ailments, formulations, and dosages were obtained from the tribal healers inhabiting the Madhupur region in Bangladesh and Curcuma caesia is used in inflammation of tonsils .
5. The powdered form is used orally with water for stomach ache and bloating (Dewangan et al., 2014).
6. Not only rhizomes but the roots of Curcuma caesia are used in Unani medicines for dyspepsia, stomach and liver tonic .
7. Kali haldi powder is used by various tribal communities in the Indian state of West Bengal's Nadia district for curing a range of ailments, such as jaundice and other diseases of the liver, allergies,diarrhoea, chronic cough, heartburn, wind, and flatulence. It has been used to reduce swelling and inflammation due to sprains, cuts, and bruises (Ghosh et al., 2013).
8. In Chhattisgarh, the rhizome is used in dried powder form as folklore medicine for the treatment of wounds, cold, cough inflammation, leucoderma, tumors, piles, bronchitis, pneumonia, asthma rheumatic pains, tooth aches and infertility etc.
9. In the North-Eastern and Central India, the dried rhizome and leaves of C.caesia are used to cure many conditions like piles, cancer, leprosy, asthma, allergies, wounds and toothaches. C.caesia rhizome have been used for wounds, pox, and tumours in Asia (Venugopal et al.,2017)
10. In Manipur, traditionally the rhizome is used for treating leucoderma, asthma, tumors, piles, bronchitis etc.
11. The paste is applied in bruises, contusions and rheumatic pains .
12. The rhizome is often used by the Baiga, Sahariya, Agariya, Gond, Korku and other tribal people of Madhya Pradesh state of India for the treatment of pneumonia, cough, cold in children and for fever and asthma in adults
13. The fresh rhizome paste of Curcuma caesia is applied during the snake bite and scorpion bite . The dried powder of C. caesia is mixed with seed powder of Andrographis paniculata Wall ex. Nees and applied during insect and snake bite .
14. In Asian Rhizome of Curcuma caecia used for wound, pox & tumour. Powdered tuber is orally administered with water in stomachache and bloating .

Antiplasmodial activity

C. caesia has a potential in the development of anti-malarial drugs. Intense parasitaemia inhibition was displayed by ethanolic extracts of C. caesia against chloroquine-resistant P. vivax, with percentages varying between 5.8% to 75.6%. When the anti-malarial effect of C. caesia was also compared to a control chloroquine dose, it showed complete parasitaemia inhibition at both low and control doses of chloroquine (Donipati et al., 2023).

Anti-Asthmatic Activity

Pritesh Paliwal et al (2011) investigated the bronchodilating activity of extracts of Curcuma caesia Bronchodilator activity of the extract was studied on the histamine aerosol induced Bronchospasm and preconvulsion dyspnoea in guinea pigs. Treatment with methanolic CC extract 500 mg/kg showed significant protection against histamine induced bronchospasm. In this study CC extract significantly prolonged the latent period of convulsions followed by exposure to histamine aerosol at the dose of 500 mg/kg and showed maximum protection as compared to chlorpheniramine maleate (standard) 2 mg/kg, p.o. which indicating its H1 receptor antagonistic activity and supports the anti-asthmatic properties of the plant.

Depressant and hypnotic activity

Curcuma caecia has potential therapeutic value for the management of depressive disorders. The methanol extract of Curcuma caecia (MECC) rhizome was evaluated for CNS depressant activities and reported that the flavonoids, saponin and tannic acid are involved for the protecting brain function from CNS disturbance antidepressant .The analgesic activity of Curcuma caecia extract (MECC) was evaluated by both acetic acid induced writhing method and tail flick method in mice to assess peripheral (non-narcotic) and central (narcotic) type of activities and revealed remarkable analgesic, locomotor depressant, anticonvulsant and hypnotic activity.

Anti-Inflammatory activity

Proteins isolated from aqueous soxhlet extraction of rhizome Curcuma caecia showed significant antioxidant activity which was found to be heat stable. When tested on the carrageenan rat paw model system it showed high anti-inflammatory activity at a dose level of 100mg/kg (angel et al 2012)

Antidiabetic activity

The ability of C. caesia to control diabetic complications such as neuropathy has been studied. Reports are available where the anti-inflammatory properties of the plant prevent nerve inflammation, and its antioxidant activity lowers the oxidative stress, a primary contributor to diabetes-related issues. The methanol extract of C. caesia rhizome significantly lowers streptozotocininduced diabetes in Wistar rats by improving the body's natural antioxidant defence system (Majumder et al.,2017).

Analgesic Activity

The analgesic properties of methanolic extract of C.caesia (MECC) at dosages of 100, 200, and 400 mg/kg body weight were assessed in animal models. The analgesic activity in Swiss albino mice was evaluated by hot plate test and acetic acid-induced writhing model, that reveals positive findings in pain relief. These studies suggest that MECC may be a natural analgesic drug. C.caesia have also been employed as an analgesic cream to alleviate pain (Sawant et al., 2014).

Different extracts obtained from C. caesia and C. amada rhizomes possess analgesic and antipyretic activity. Analgesic and antipyretic activities of the plant extracts was evaluated using chemical model of acute pain and brewer's yeast induced hyperthermia in rats. The writhing and pyrexia were observed at

the doses of 250 and 500 mg/kg body weight of rats. Both the plants exerted analgesic and antipyretic activity. Where by C.amada showed better response in comparison to C. caesia (Kaur et al., 2013)

Antifungal activity

Anti-fungal Activity Banerjee and Nigam, 1976 reported antifungal activity in C. caesia rhizomes. Essential oil of rhizomes of C. caesia Roxb has been known for its antifungal activity.

Rhizomes of Curcuma caesia possessed antifungal activity. Essential oils extracted from the rhizomes were tested for antifungal activity against several human and plant pathogenic fungi. Dilutions of the oil in ethylene glycol were tested by an agar diffusion procedure on plates seeded with the test isolates. Some antifungal effect was noted. The antimicrobial activity of ethanolic extract of CC was due to the presence of various type of curcumoid like substrate, which is confirmed by the TLC26. "(Z)-7-methoxy-1, 5-dihydrobenzo[c] oxepine" is a terpenoid, isolated from CC shows antifungal as well as antibacterial activities against some major plant pathogenic microbes

Anthelmintic activity

Gill et al. (2011) studied anthelmintic activity of solvent extracts of Curcuma caesia and C.zedoaria. The efficacy of the extracts on paralysis time and time of death of earthworms was studied. The extracts of both the plants exhibited dose dependant activity. The results indicated that the ethanol extract of Curcuma caesia was the most effective.

Antimicrobial activity

The isolated oil from the rhizome of Curcuma caecia possessed high antioxidant activity, antibacterial activity and also inhibit g +ve such as S. aureus and B. subtilis and g-ve such as E. coli bacteria. Essential oils comprising of mixtures of monoterpenes, sesquiterpenes, and various aliphatic hydrocarbons are potential sources of antimicrobial compounds .Ethanolic extract of Curcuma caecia (EECC) showed a significant antibacterial activity against Staphyloccocus aureus. (angel et al 2012)

Anticancer

Cancer affectsmillions of populationacross the globe,hence thereis persistent demand for development of new drugs and therapies for its treatment.Development of natural therapeutics especially from plants source for the cancer treatment always withdraws the investigators attention. A study performed evaluation of chemopraticresponse of

C. Caesia using mouse model. Study revealed that C. Caesia methanolic extract can restore the diethyl nitrosamine structural anomalies. Additionally, the Caesia rhizome hexane extract exhibited its potential to inhibit the proliferation of the human liver adenocarcinoma (HEPG2) cell line

Discussion and conclusion

We thus arrive at the conclusion that black turmeric is, indeed, a plant rich in medicinal properties. This plant exhibits anti-plasmodial, anti-asthmatic, anti-inflammatory, anti-diabetic, anti-fungal, anti-microbial, and anti-helminthic activities; furthermore, it possesses anti-cancer properties. Its utility in treating various types of ailments serves as definitive proof of its therapeutic value. Such plants should be naturally conserved within forests, and farmers should also be encouraged to cultivate them as medicinal crops, thereby enabling us to foster the progress of the farming community.

Acknowledgment

I would like to express my gratitude to the Almighty God, who inspired me to write this research paper.I wish to thank all my colleagues who consistently encouraged me to write. I would like to thank everyone

who assisted me, directly or indirectly, in writing this paper. I extend my thanks to all the researchers whose work enabled me to produce this research paper. I am grateful to my family for providing me with the peace and time necessary to write this paper. Finally, I would like to thank all the scientists who assisted me in the writing of this paper.

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Plant -C. caesia Roxb.